

4/6/2018

Print



Dart Hawkesbury
1270 Aberdeen St Hawkesbury, ON K6A 1K7 Canada
Tel (613) 632-5200

Purchasing Receipts

PO No	Supplier	Line Item No	Rel No	Terms	Purchased Item	Description	For Part No	Project	Equipment ID	Order Qty	Due Date	Received Quantity	Accounting Job No	Container No	Status	Receive Date	Price/Unit	Aging Days	Past Due	T	
PO039505	ACI001-VC	1	1	Net 30	MT-4140QT-R4.000	AISI 4140 Quenched & Tempered Steel Round Bar 4.000" Dia. : AISI 4140 Q&T Round Bar : MAT'L: AISI 4130 QUENCHED & TEMPERED ROUND BAR AS PER ASTM 4140 QT OR ASTM 4142 QT				2	4/11/2018	2		S058924	Stock	4/6/2018	\$ 86.95 / ft	0		\$	
		2			MT-4140-R2.000	AISI 4140 Round Bar : MAT"L, AISI 4140 ROUND BAR MINIMUM ROCKWELL C = 20 Rc MAXIMUM ROCKWELL C = 38 Rc SPECIFICATION: ASTM A29, AMS 6349, AMS 6382, AMS 6529						2		S058925	Stock	4/6/2018	\$ 19.16 / ft	0			
Total:										4		4									\$1

Plex 4/6/2018 1:26 PM Dart Dubois.Pascal



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO039505

Supplier: ACI001-VC
Acier Ouellette Inc.
935 Boul. Du Havre
Valleyfield
QC
J6S 5L1 Canada
Phone: 800 667 4248
Fax: 450 377 5696

PO No: PO039505
PO Date: 4/4/18
Due Date: 4/11/18
Purchase Order Revision:
Revision Date:
Ship-To Contact: Lavoie, Chantal
Phone: clavoie@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pynt Terms: Net 30

Freight Terms:

Special Comments: QUOTE NO SOU0093341

Items										
Line Item	Part	Supplier Part No	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	MT-4140QT-R4.000		AISI 4140 Quenched & Tempered Steel Round Bar 4.000" Dia. : AISI 4140 Q&T Round Bar : MAT'L: AISI 4130 QUENCHED & TEMPERED ROUND BAR AS PER ASTM 4140 QT OR ASTM 4142 QT	Firmed	4/11/18	2 ft	0 ft	2 ft	\$86.95/ft	\$173.90
2	MT-4140-R2.000		AISI 4140 Round Bar : MAT'L, AISI 4140 ROUND BAR MINIMUM ROCKWELL C = 20 Rc MAXIMUM ROCKWELL C = 38 Rc SPECIFICATION: ASTM A29, AMS 6349, AMS 6382, AMS 6529	Firmed	4/11/18	2 ft	0 ft	2 ft	\$19.1555/ft	\$38.31
3	M6061T6S2.750X4.000		6061-T6 SHEET 2.75 Thick x 4.000 Wide : PURCHASE MATERIAL: 6061- T6/T62/T651 ALUMINUM SHEET OR PLATE SPECIFICATION: QQ-A- 250/11 OR AMS-QQ-A- 250/11 OR AMS 4025 OR 4027 OR ASTM B209 receive ft	Firmed	4/11/18	6 ft	0 ft	6 ft	\$64.16666/ft	\$385.00

Grand Total: \$597.21

Order Notes

Procurement Quality Clauses

A005 right of entry

A012 chemical and physical test report

A016 personnel qualification

A017 raw material identification (as applicable)

A026 certification of material conformance

A041 quality management system

A042 dart notification by supplier

A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

CZ

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 4/6/18 12:49 PM dart.dubois.pascal



DELIVERY - CLIENT

Copy

CO00082164

ACIER OUELLETTE INC.
935, Boul. du Havre
Salaberry de Valleyfield (Québec) J6S 5L1
Tél.: 450-377-4248 Mtl: 514-336-4248 Ext.: 800-667-4248
Fax: 450-377-5696 Mtl: 514-336-4246 Ext.: 866-456-4242

Billed to

DART AEROSPACE LTD

1270, ABERDEEN ST.
HAWKESBURY, Ontario, K6A 1K7

Shipped to

, Ontario,

Att : CHANTAL LAVOIE Tél.: 613-632-5200

Instruction F-M

Delivery Route 5

Page

1

Customer N°

CL10001056

Date

2018/04/05

Delivery date

2018/04/06

Your order N°

039505

Processed by

Josianne Bourdon

Salesman

Carrier

OUELLETTE VALLEYFIELD

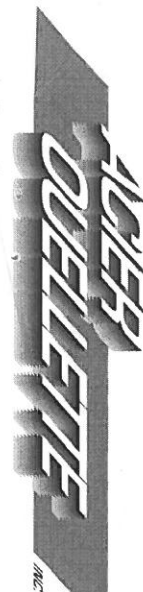
Credit Terme

Net 30 Days

Product Description	Weight	Qty	U/M	PCS NB			Internal Use Only			
				CMD	EXP	B/O	IN	I	S	C
1 ROUND 4140 HEAT TREAT 4 (R) R4140-4H 4965 <i>1 X 24" LINE 1 HEAT: 12080470 COUPE A LA SCIE SCIE</i> 1	88.14	2.00	PI_\$CLB		1 X 24"		2			APR 06 2018 DAS 11 9-89
2 ROUND 4140 ANNEALED 2 (R) R4140-2A 4935 <i>1 X 24" LINE 2 HEAT: 144805 COUPE A LA SCIE SCIE</i> 1	21.36	2.00	PI_\$CLB		1 X 24"		2			APR 06 2018 DAS 11 9-89

NIR : R-109516-6

Next Page...

**ACIER OUELLETTE INC.**

935, Boul. du Hâvre
Salaberry de Valleyfield (Québec) J6S 5L1
Tél.: 450-377-4248 Mtl: 514-336-4248 Ext.: 800-667-4248
Fax: 450-377-5696 Mtl: 514-336-4246 Ext.: 866-456-4242

DELIVERY - CLIENT**Copy**

C000082164

Billed to

DART AEROSPACE LTD

1270, ABERDEEN ST.
HAWKESBURY, Ontario, K6A 1K7

Shipped to

, Ontario,

Att : CHANTAL LAVOIE Tél.: 613-632-5200

Instruction F-M

Delivery Route 5

Page

2

Customer N° CL10001056
Date 2018/04/05
Delivery date **2018/04/06**
Your order N° 039505
Processed by Josianne Bourdon
Salesman
Carrier OUELLETTE VALLEYFIELD
Credit Terme Net 30 Days

Product Description	Weight	Qty	U/M	PCS NB			Internal Use Only			
				CMD	EXP	B/O	IN	I	S	C

Total Weight (lbs) : 109.50

NIR : R-109516-6

Conditions :
All sold and delivered materials remain the property of "Acier Ouellette Inc" until payment is made in full, complete and cashed. All lost materials are at the buyer's expense. The warranty offered by "Acier Ouellette Inc." is the same as offered and honored by the manufacturer and his warranty is transferred by "Acier Ouellette Inc." to the client. The buyer hereby accepts to respect the following conditions: Net 30 days from billing date and the buyer accepts to pay administration charges of 2% per month (24% per annum) on all past due amounts over 30 days. Any default in respect with this contract will lead to payment by acceleration and permits to the seller, at his choice to claim for the balance due or the repossession of the goods sold. All claims must be made within five (5) days with this document enclosed. Any merchandise that has been damaged, cut or modified cannot be returned. All goods returned must be with our authorization and are subject to a 25% restocking charge.

Prepared By :

Verified By :

Delivered By :

Time

Customer's Signature

Date

Total (\$CAD)

Eaton Steel Bar Company Inspection Certificate 1701209

EN 10204:2004-3.1

Customer

BOL	Ship Date	Customer PO	Item	Customer Item	Item Description
225539	19-Feb-2018	B40059	8556 rev 008	013733	4 HR RD 4140TKR 21/24H SBO QTSF VD Ca-AL-FG MST

All bundles listed below were produced using steel from Heat 12060470 issued by GERDAU-BRAZIL and were completed from Eaton Steel Job 823764.

Chemistry	Description	Value	Units	Jominy	Description	Value	Units
C	Carbon	0.41000	PMGT	J30	30/16 inch from Quenched End	42	HRC
Mn	Manganese	0.94000	PMGT	J32	32/16 inch from Quenched End	42	HRC
P	Phosphorus	0.01400	PMGT	Mechanical			
S	Sulfur	0.01400	PMGT	TENSILE PSI			
Si	Silicon	0.29000	PMGT	YIELD PSI			
Ni	Nickel	0.09000	PMGT	ELONGATION			
Cc	Chromium	1.04000	PMGT	REDUCTION			
Mo	Molybdenum	0.24000	PMGT	BRINELL SURF			
Al	Aluminum	0.01700	PMGT	Heat Treating			
Cu	Copper	0.18000	PMGT	TEMPER TEMP F			
V	Vanadium	0.00400	PMGT	AUSTEN TEMP F			
Cb	Columbium	0.00400	PMGT	SR TEMP F			
N	Nitrogen	0.00570	PMGT	MAGNETISM-HT			
DI	Ideal Diameter	6.62910	IN	TIME AT TEMP			
Cleanliness				QUENCH MEDIA			
SAE J422 OX	SAE J422 Oxide Rating	0.0 - 5.0	NOM	STRESS FREE			
SAE J422 SI	SAE J422 Silicate Rating	0.0 - 5.0	NOM	HT4140-42QT			
MACRO ETCH				Mill Processing			
Report macro etch results.				MELT COUNTRY			
Geometry				ROLLED COUNTRY			
DIAMETER				RED RATIO			
Description				ASTM Standard			
Jominy				A193/193M-01			
Description				A434-90a-BC			
Value				Structure			
Units				PERCENT TM			
Description				MICROSTRUCTURE			
Value				Tag Number			
Units				022-2203726			
Description				Qty			
Value				8858			
Units				Length			
Description				22ft10in/21ft10in			

Bundle tags with Eaton Steel identifiers reference the steel grade, heat, purchase order number where applicable, part number, product description and quantity. Material produced in accordance with Eaton Steel's Quality Manual QM-00002 Rev 0 dated 11/21/2013.

We hereby certify the above to be in conformance, and a true copy of data represented in company records. This steel was not subject to weld repair or exposed to mercury while in the possession of Eaton Steel.

Created on 19-Feb-2018

Marc Benjamin, Corporate Metallurgist

The document was prepared by means of a computer program and is valid without signature.

10221 Capital Avenue, Oak Park, MI 48237 USA
http://www.eatonsteel.com

Tel: 248-398-3434
Fax: 248-398-1434



OUR MANAGEMENT SYSTEM IS CERTIFIED TO ISO 9001 / TS 16949 / ISO 14001

PART NUMBER 8168		PESO/WEIGHT (KG) 40.553,000		MATERIAL/MATERIAL 705013345		PRODUTO/PRODUCT HOT ROLLED ROUND BAR		Cert. N° 0000022442	
CLIENTE/CLIENT EATON STEEL BAR COMPANY				QUALIDADE/GRADE 4140TKR		NO HEAT TREATMENT AS ROLLED		CORRIDA/HEAT 12080470	
NORMA/SPECIFICATION SPEC FOR ITEM 8168 006 23.01.2014									
Nota Fiscal/Invoice		Pedido/Cust.Order		Ord-Fornec/Ord-Supply		Lote/Batch		Peso/Weight (Kg)	
0000017226		162566		5336580 - 8108897269		1208047006		22.523,000	
0000017311		162566		5336580 - 8108972888		1208047006		13.530,000	
0000017692		162566		5336580 - 8109066468		1208047007		4.500,000	
ANÁLISE QUÍMICA/CHEMICAL COMPOSITION									
C	Mn	Si	P	S	Cr	Ni	Mo	V	Cu
0,410	0,94	0,29	0,014	0,014	1,04	0,09	0,24	0,0040	0,180
H	Ca	As	Sb	DI					
1,00	0,0008	0,0030	0,0020	6,6291					
ENSaios MECÂNICOS/MECHANICAL PROP									
Hardness									
HB									
306,00									
ENSaios METALOGRAFICOS/METALLOGRAPHIC TESTS									
Austenitic									
Grain Size									
7									
MICROINCLUSÕES/INCLUSION RATING NUMBER									
ASTM/SAE									
REGULAR	A - TS	A - HS	B - TS	B - HS	C - TS	C - HS	D - TS	D - HS	
1,5	1,0	0,0	1,5	0,0	0,0	0,0	1,0	0,0	
SAE	Oxide	Silicates							
REGULAR	0,0	0,0							
MACROGRAFIA/MACROGRAPHY									
Blue									
Fracture									
(H)									
1									



CERTIFICADO DE QUALIDADE
QUALITY CERTIFICATE
CERTIFICADO DE CALIDAD

OUR MANAGEMENT SYSTEM IS CERTIFIED TO ISO 9001 / TS 16949 / ISO 14001

PART NUMBER 8168	PESO/WEIGHT (KG) 40.553,000	MATERIAL/MATERIAL 705013345	PRODUTO/PRODUCT HOT ROLLED ROUND BAR	Cert. N° 0000022442																																																			
CLIENTE/CLIENT BATON STEEL BAR COMPANY		QUALIDADE/GRADE 4140TKR	NO HEAT TREATMENT AS ROLLED	CORRIDA/HEAT 12080470																																																			
<p>TEMPERABILIDADE/HARDENABILITY</p> <table border="1"> <thead> <tr> <th>1/16"</th> <th>2/16"</th> <th>3/16"</th> <th>4/16"</th> <th>5/16"</th> <th>6/16"</th> <th>7/16"</th> <th>8/16"</th> <th>9/16"</th> <th>10/16"</th> <th>11/16"</th> <th>12/16"</th> <th>14/16"</th> <th>16/16"</th> <th>18/16"</th> <th>20/16"</th> <th>22/16"</th> </tr> </thead> <tbody> <tr> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> <td>HRC</td> </tr> <tr> <td>59,5</td> <td>59,1</td> <td>58,8</td> <td>58,2</td> <td>58,0</td> <td>57,8</td> <td>57,5</td> <td>57,0</td> <td>56,5</td> <td>56,0</td> <td>55,6</td> <td>54,0</td> <td>52,5</td> <td>51,3</td> <td>49,8</td> <td>46,5</td> <td>43,5</td> </tr> </tbody> </table>					1/16"	2/16"	3/16"	4/16"	5/16"	6/16"	7/16"	8/16"	9/16"	10/16"	11/16"	12/16"	14/16"	16/16"	18/16"	20/16"	22/16"	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	59,5	59,1	58,8	58,2	58,0	57,8	57,5	57,0	56,5	56,0	55,6	54,0	52,5	51,3	49,8	46,5	43,5
1/16"	2/16"	3/16"	4/16"	5/16"	6/16"	7/16"	8/16"	9/16"	10/16"	11/16"	12/16"	14/16"	16/16"	18/16"	20/16"	22/16"																																							
HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC	HRC																																							
59,5	59,1	58,8	58,2	58,0	57,8	57,5	57,0	56,5	56,0	55,6	54,0	52,5	51,3	49,8	46,5	43,5																																							
<p>GRAU DE REDUÇÃO/REDUCTION RATE</p> <p>6,9941 : 1</p>																																																							
<p>OBSERVAÇÕES/OBSERVATIONS</p> <p>Meltshop route: EAF, LF, VD, CC.</p> <p>Made in Brazil at Gerdau Charqueadas.</p> <p>Produced according to ASTM A304 and ASTM A322</p> <p>Reduction Ratio: 7,1:1</p> <p>Melted in Brazil</p> <p>Rolled in Brazil</p>																																																							
<p>ENVIRONMENTAL RECOMMENDATIONS RELATED TO PRODUCTS:</p> <p>In order to contribute with the environment and sustainable development of our productive chain, we recommend to our clients to dispose accordingly the waste related to our products, according to the environmental legislation of your region, state or country.</p>																																																							
<p>DEPARTAMENTO DA QUALIDADE / QUALITY DEPARTMENT</p> <p>BR-ML-CHARQUEADAS-AFP. 20.09.2017</p> <p>ANDRÉ L. SILVA FAGUNDES CREA 0682601000</p>																																																							

Lab Services Report



10221 Capital Avenue
Oak Park MI 48237
(248)543-3578 telephone
(248)398-1434 facsimile

Bill To: Apollo Heat Treating and
Processing Company, L.L.C.
10400 Capital Avenue

Oak Park, MI

Attn: Randy Call
rcall@apollohtp.com

Ship To: Apollo Heat Treating and
Processing Company, L.L.C.
10400 Capital Avenue
Oak Park, MI

Report Date: 12/20/2017

Report ID: 17-4982

Request ID:

This report contains results for the indicated services performed on the following sample(s):

Part No	8556	Finish	HR	Shape	Round	PO #:	823764
Size	4.000	Grade	4142	Work Order	823764		
Titan Sample ID		Heat	Customer Sample ID				
17-4982-1		12080470	823764 JOB 3173				

Steve Avery

Report Approved By: Steve Avery

Mechanical Testing

ASTM E8M-16a

ASTM E10-17

Sample ID	Ultimate Tensile, psi	0.2% Offset Yield, psi	Elongation - Manual, %	Reduction of Area, %	HBW Surface
17-4982-1	153,100	134,400	19	55	313

Test Comments

Mechanicals tested at Midradius



Certificate Number: 2007.01 Any services within a section marked with * are not part of Titan Metallurgy's current A2LA accreditation.

Testing Laboratory

All testing performed by Titan Metallurgy was done at ambient (room) temperature.

Report ID:17-4982

Page 1 of 1



Heat Treating & Processing Company, L.L.C.

10400 Capital Avenue • Oak Park, Michigan 48237 • (248) 398-3434

CERTIFICATION OF HEAT TREATMENT

Date: 12 / 29 / 2017

Certification Number: 17 - 0888

Customers Order Number: 823764

Part Number: 8168 - 8556

Heat Number: 12080470

Heat Treat Job Number: 3173

Material: 4140

Quantity: 84 Pcs.

Weight: 83,449 Lbs.

Description: 4.0000" Diameter x 23' 4" Length

Per Specification: ESHT HT4140 - 42QT

	Temperature	Time at Heat	Coolant
Normalized	N/A		
Preheat	N/A		
Austenitized/Hardened	1575 °F	1 Hour 30 Minutes	
Spray Quenched	98.1 °F – 104.9 °F	N/A	Water
Temper	1150 °F	2 Hours 35 Minutes	Air Cooled to Ambient
Temper	N/A		

Method of heat treat monitor, set point thermocouple (Type K). Equipment calibrated per AMS2750E.
We hereby certify the above material has been treated in the manner described are correct as
contained in the records of Apollo Heat Treating and Processing, LLC.

A handwritten signature in black ink, appearing to read 'Randy L. Call', is written over a horizontal line.

Randy L. Call

Plant Manager

Apollo Heat Treating & Processing, LLC



10400 Capital Avenue • Oak Park, Michigan 48237 • (248) 398-3434

CERTIFICATION OF HEAT TREATMENT

Date: 12 / 29 / 2017
Certification Number: 17 - 0889
Customers Order Number: 823764
Part Number: 8168 - 8556
Heat Number: 12080470
Heat Treat Job Number: 3173

Material: 4140
Quantity: 91 Pcs.
Weight: 91,375 Lbs.
Description: 4.0000" Diameter x 23' 4" Length
Per Specification: ESHT HT4140 - 42QT

	Temperature	Time at Heat	Coolant
Normalized	N/A		
Preheat	N/A		
Austenitized/Hardened	1575 °F	1 Hour 30 Minutes	
Spray Quenched	98.1 °F - 104.9 °F	N/A	Water
Temper	1150 °F	2 Hours 35 Minutes	Air Cooled to Ambient
Temper	N/A		

Method of heat treat monitor, set point thermocouple (Type K). Equipment calibrated per AMS2750E.
We hereby certify the above material has been treated in the manner described are correct as
contained in the records of Apollo Heat Treating and Processing, LLC.

A handwritten signature in black ink, appearing to read 'Randy L. Cail', is written over a horizontal line.

Randy L. Cail
Plant Manager
Apollo Heat Treating & Processing, LLC

Eaton Steel Bar Company Inspection Certificate 1506751

EN 10204:2004-3.1

Customer	BOL	Ship Date	Customer PO	Item	Customer Item	Item Description
	176582	22-May-2015	B69339	8814 rev 002	013743	2 HR RD 4140ME 18ft LPA FG MST

All bundles listed below were produced using steel from Heat 144805 issued by ALTON STEEL and were completed from Eaton Steel Job 763566.

Chemistry	Description	Value	Units	Heat Treating	Description	Value	Units
C	Carbon	0.41000	PMGT	Austen Temp F	Austenize Temp in Fahrenheit	1600 - 1700	DRGF
Mn	Manganese	0.89000	PMGT	Magnetism-HT	Magnetism in Gauss	0 - 20	GN
P	Phosphorus	0.01500	PMGT	MST-HT	Machine Straighten Report	Satisfactory	
S	Sulfur	0.02400	PMGT	TIME AT TEMP	Time at Temperature	Value	Units
Si	Silicon	0.24000	PMGT	MILL PROCESSING	Description	USA	
Ni	Nickel	0.09100	PMGT	MELT COUNTRY	Melted in Country	USA	
Cr	Chromium	0.83500	PMGT	ROLLED COUNTRY	Rollled in Country	USA	
Mo	Molybdenum	0.16000	PMGT	RED RATIO	Reduction Ratio	15.60	RED
Al	Aluminum	0.00300	PMGT	ASTM Standard	Description	Value	Units
Cu	Copper	0.28000	PMGT	A32-91	Steel Bars, Alloy, Standard Grades	CONFORMS	
V	Vanadium	0.00500	PMGT	Structure	Percent Lamellar Pearlite	70 - 100	Units
Ca	Calcium	0.03000	PMGT	PERCENT LP	Percent Lamellar Pearlite	Value	Units
N	Nitrogen	0.00190	PMGT	MICROSTRUCTURE	Reported Microstructure	LP	PCF
DI	Ideal Diameter	0.01220	PMGT	Tag Number	022-1591052	Qty Units	Length
		4.83000	IN			8230 LBS	18ft
Cleanliness	Description	Value	Units				
MACRO ETCH	Report macro etch results.						
Geometry	Description	Value	Units				
DIAMETER	Diameter	1.9844 - 2.0156	IN				
Joinery	Description	Value	Units				
J1	1/16 inch from Quenched End	56	ERC				
J2	2/16 inch from Quenched End	56	ERC				
J3	3/16 inch from Quenched End	56	ERC				
J4	4/16 inch from Quenched End	56	ERC				
J5	5/16 inch from Quenched End	56	ERC				
J6	6/16 inch from Quenched End	54	ERC				
J7	7/16 inch from Quenched End	53	ERC				
J8	8/16 inch from Quenched End	51	ERC				
J9	9/16 inch from Quenched End	50	ERC				
J10	10/16 inch from Quenched End	48	ERC				
J11	11/16 inch from Quenched End	46	ERC				
J12	12/16 inch from Quenched End	44	ERC				
J13	13/16 inch from Quenched End	42	ERC				
J14	14/16 inch from Quenched End	41	ERC				
J15	15/16 inch from Quenched End	40	ERC				
J16	16/16 inch from Quenched End	38	ERC				
J17	17/16 inch from Quenched End	35	ERC				
J18	18/16 inch from Quenched End	34	ERC				
J19	19/16 inch from Quenched End	34	ERC				
J20	20/16 inch from Quenched End	34	ERC				
J21	21/16 inch from Quenched End	34	ERC				
J22	22/16 inch from Quenched End	34	ERC				
J23	23/16 inch from Quenched End	34	ERC				
J24	24/16 inch from Quenched End	34	ERC				
J25	25/16 inch from Quenched End	34	ERC				
J26	26/16 inch from Quenched End	34	ERC				
J27	27/16 inch from Quenched End	34	ERC				
J28	28/16 inch from Quenched End	34	ERC				
J29	29/16 inch from Quenched End	34	ERC				
J30	30/16 inch from Quenched End	34	ERC				
J31	31/16 inch from Quenched End	34	ERC				
J32	32/16 inch from Quenched End	34	ERC				
Mechanical	Description	Value	Units				
BRINELL MID	Brinell Mid Radius	197.0	BRN				

Bundle tags with Eaton Steel Identifiers reference the steel grade, heat, purchase order number, part number, product description and weight. Tested and certified in accordance with Eaton Steel's Quality Manual QM-00001 / Rev 3 / 2/26/13.

We hereby certify the above to be in conformance, and a true copy of data represented in company records. This steel was not subject to weld repair or exposed to mercury while in the possession of Eaton Steel.

Created on 22-May-2015 This document was prepared by means of electronic data processing and is valid without signature.

Thomas Snabcs, Corporate Metallurgist 10221 Capital Avenue, Oak Park, MI 48227 USA Tel: 248-398-3434 Fax: 248-398-1434

http://www.eatonsteel.com



CERTIFIED MILL TEST REPORT

Alton Steel Test Lab
#5 Oak Street
Alton, IL 62002-5011
(618) 462-4490 EXT 2486
(618) 463-4491 (Fax)

BILL TO

Eaton Steel Corporation
10221 Capital Avenue

SHIP TO

Eaton Steel Corporation
Super Steel Treating Company
CWC - To be delivered to customer's
Truck
Alton, IL 62002

Oak Park, IL 4837

Date:	09/24/2014	Customer PO	148131	Specification	SAE 4140H
ASTM Ord No.	70013	Customer PT.	1003673	ASTM A 29-12	ASTM A 322-07
Item Description	Steel Bar, Hot Rolled, 2.0000, 18" 0"				
Heat Number	Steel Bar, Hot Rolled, 2.0000, 18" 0"				

Heat Number

Yield PSI

Tensile PSI

% Elongation

% R_{OA}

Bend Test

CHEMICAL ANALYSIS TEST METHODS ASTM E-415 & E-1019

Heat Number	C	Mn	P	S	Si	Cu	NI	Cr	Mo	Sn	Al	Nb/CD	V	B	TI	N	Ca
144805	0.41	0.89	0.015	0.004	0.24	0.28	0.091	0.835	0.160	0.012	0.003	0.030	0.005	0.0004	0.0010	0.0122	0.0019

JOINTLY HARDENABILITY USING ASTM A-255 CALCULATED FROM CHEMICAL DT

Heat Number	GS	DI	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J14	J16	J18	J20	J24	J28	J32
144805	8	4.83																			

SPECIAL TEST RESULTS

ASTM E-45 Method A:	ASTM E-45 Method C:	SAE J422	ASTM E-381	Charpy	Hardness
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Heat Number	TA	TB	TC	TD	HA	HB	HC	HD	S	O	S	O	S	R	C	RC	RB	RFM
144805																		

ADDITIONAL COMMENTS

No mercury, lead, radium, or alpha emitting material or equipment is used or deliberately added in the production of this steel. No weld or weld repairs were performed on this material. This steel is 100% Electric Arc Furnace melted and rolled in the U.S.A. Material qualifies as A1007A origin.

Subscribed and sworn to before me, a Notary Public, in and for the county of Madison, State of Illinois

this _____ day of _____

My commission expires _____

(Notary Public)

Attention or reproduction of this report, except in full, is not allowed without written approval by a representative of Alton Steel Incorporated.

I hereby certify that the above tests are correct as contained in the records of ALTON STEEL, INCORPORATED

Quality Leader: Josh Levi



Super Steel Treating
6227 Rinke Ave
Warren MI 48091
(586) 755-8140
ISO 9001:2008 Registered

Quality Report

Date	Q.C. ID No.
10/17/14	WOBR137106

Customer: EATON STEEL CORP

Metallurgist: AJR

Metallurgical Certification

Customer: EATON STEEL CORP P/LT#2
Grade: 4140
Size: 2.0000
Heat No: 144805
Receiver: BR137106
Cust PO: 147376
Mill Notes:
Our Part: EAT05563
Cust Part: 8914

Furnace Process: 1
Date Processed: 10/17/14
Accepted Weight: 64500
Accepted Qty: 7
Mill: ALTON
Release No:
Process TY: LPA

Representative Sampling

Sample	Coil ID#	Decarb	YF	-- Mid Radius --	--- Surface ---	Microstructure
137199		0.010		HRB HRC HB HRS HRC HB	100% PEARLITE	
Coil/Bundle ID:	144805001	144805002	144805003	144805004		
	144805005	144805006	144805007			

W0763566A
cert 389808

MATERIAL RECEIPT INSPECTION FORM

MATERIAL: MT-4140-R2.000
 DATE: APR 06 2018

PO / BATCH NO: 239505/5058925

MATERIAL CERT REC'D: yes
 QUANTITY RECEIVED: 2
 QUANTITY INSPECTED: 2
 QUANTITY REJECTED: 0

THICKNESS ORDERED: 2.000
 THICKNESS RECEIVED: 2.000
 SHEET SIZE ORDERED: N/A
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)	COMMENTS
SURFACE DAMAGE	Y (N)	
CORRECT FINISH	(Y) N	
CORROSION	Y (N)	
CORRECT GRAIN DIRECTION	(Y) N	
CORRECT MATERIAL PER M-DRAWING	(Y) N	<u>Astm A29</u>
CORRECT THICKNESS	(Y) N	
PHOTO REQUIRED	Y (N)	
CORRECT REF # TO LINK CERT	(Y) N	<u>Heat # 144805</u>
CORRECT MATERIAL IDENTIFICATION	(Y) N	
CORRECT M# ON THE MATERIAL	(Y) N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y (N)	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y (N)	

CUT SAMPLE PIECE OF MATERIAL AND PREFORM A HARDNESS CHECK. RECORD RESULTS BELOW					
	HRC	HRB	DUR A	DUR D	WEBSTER
TYPE OF MATERIAL					
SIZE OF TEST SAMPLE					
HARDNESS / DUROMETER READING					

testers located in the Quality Office

QC 18 INSPECTION	ENGINEERING SIGNOFF (if required)
INSPECTED BY: <u>DAS 11</u>	SIGNED OFF BY: _____
DATE: <u>9-89 APR 06 2018</u>	DATE: _____

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

REV.	DESCRIPTION	ECN #	DATE	BY	APPROVED
A	NEW ISSUE	17-790	17.12.13	VM	ML

SPECIFICATION CONTROL DRAWING

PURCHASE MATERIAL : AISI 4140 ROUND BAR
MINIMUM ROCKWELL C = 20 Rc
MAXIMUM ROCKWELL C = 38 Rc

SPECIFICATION:

ASTM A29, AMS 6349, AMS 6382, AMS 6629

PART NUMBER:

MT-4140-R-ID-DDI
WHERE "D.D.D" = DIAMETER IN INCHES

EX. 4" ROUND BAR = MT-4140-R-4.000

DART AEROSPACE Hamilton, Ontario, Canada	
TITLE AISI 4140 ROUND BAR	
PART NO. MT-4140-R	REV A
TOOL NO. UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DIMENSIONS APPLY AFTER FINISHING DIMENSIONS APPLY AFTER FINISHING	
DESIGNED BY: VM 17/12/13	TOLERANCES: XX ± .005 X ± .1
DRAWN BY: VM 12/13/2017	FINISHES: X 1 X 2
CHECKED BY: ML 12/18/2017	ROUNDS: X 1 X 2
APPROVED BY: DP 12/20/2017	SCALE: 1:1
DATE: 12/20/2017	SHEET 1 OF 1
(THIS DRAWING IS THE PROPERTY OF DART AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM DART AEROSPACE LTD.)	

MATERIAL RECEIPT INSPECTION FORM

MATERIAL: MT-4140QT-R4.000
DATE: APR 06 2018

PO / BATCH NO.: 039505/5058924

MATERIAL CERT REC'D: yes
QUANTITY RECEIVED: 2
QUANTITY INSPECTED: 2
QUANTITY REJECTED: 0

THICKNESS ORDERED: 4.000
THICKNESS RECEIVED: 4.000
SHEET SIZE ORDERED: N/A
SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)		COMMENTS
SURFACE DAMAGE	Y	(N)	
CORRECT FINISH	(Y)	N	
CORROSION	Y	(N)	
CORRECT GRAIN DIRECTION	(Y)	N	
CORRECT MATERIAL PER M-DRAWING	(Y)	N	<u>ASTM 4140-42QT</u>
CORRECT THICKNESS	(Y)	N	
PHOTO REQUIRED	X	(N)	
CORRECT REF # TO LINK CERT	(Y)	N	<u>Heat # 12080470</u>
CORRECT MATERIAL IDENTIFICATION	(Y)	N	
CORRECT M# ON THE MATERIAL	(Y)	N	
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y	(N)	
DOES THIS REQUIRE AN EXTRUSION REPORT	Y	(N)	

CUT SAMPLE PIECE OF MATERIAL AND PREFORM A HARDNESS CHECK. RECORD RESULTS BELOW					
	HRC	HRB	DUR A	DUR D	WEBSTER
TYPE OF MATERIAL					
SIZE OF TEST SAMPLE					
HARDNESS / DUROMETER READING					

testers located in the Quality Office

QC 18 INSPECTION		ENGINEERING SIGNOFF (if required)	
INSPECTED BY: <u>DAS 11</u>	SIGNED OFF BY: _____		
DATE: <u>9-89 APR 06 2018</u>	DATE: _____		

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

SPECIFICATION CONTROL DRAWING

PURCHASE MATERIAL : AISI 4140 QUENCHED & TEMPERED STEEL ROUND BAR

SPECIFICATION:

ASTM 4140 QT or ASTM 4142 QT

PART NUMBER:

MT-4140QT-R [D.DDD]

WHERE "D.DDD" = DIAMETER IN INCHES

EG. 5/8" ROUND BAR = MT-4140QT-R0.625

REV.	DESCRIPTION	DATE	BY	APPROVED
A	NEW ISSUE	17.09.12	VM	VM

DART AEROSPACE Hawkebury, Ontario, Canada	
TITLE: AISI 4140 Q&T ROUND BAR	
DWG NO.	REV
MT-4140QT-R	A
DESIGN BY: VM 8/9/2017	200 ± .005 FRACTIONS ± .18
DRAWN BY: VM 09/14/2017	XX ± .01 ANGLES ± .5°
CHECKED: VM 09/14/2017	1. DIMENSIONS ARE IN INCHES
QC APPR: DP 09/14/2017	2. INTERPRET DIM AND TOL PER
QA APPR: PD 09/14/2017	3. ASME Y14.3M-2009
APPROVED: VM 09/14/2017	4. DIMENSIONS IN PARENTS APPLY
DATE: 9/14/2017	SCALE: NTS WEIGHT: 0.0 LBS
SHEET 1 OF 1	
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ECW 11-655